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NEW DESCRIPTIONS OF LARVAE OF FOREST INSECTS: *NYCTOBIA*, *EUFIDONIA* (LEPIDOPTERA, GEOMETRIDAE)*

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Amongst the several species of green loopers found on Canadian coniferous trees in July are two which, to the naked eye, appear somewhat similar. These are *Nyctobia limitaria* Wlk. and *Eufidonia notataria* Wlk. Larvae of these two, along with that of the other Nearctic species of *Eufidonia*, i.e. *discospilata* Wlk., a heath-plant feeder, are herewith described. The larva of *E. notataria* has been described briefly by Goodell (1, 2).

The writer wishes to express his gratitude to Miss M. R. MacKay for much help and constructive criticism in the preparation of the illustrations for this paper, and to officers of the Forest Insect Survey staff in Ottawa for the loan of a number of larval specimens of the species *E. notataria* Wlk.

Nyctobia limitaria Wlk.

Egg: (Described from empty shells found on the new growth of balsam fir on which very small larvae of this species were feeding). Length 0.7 mm. Width 0.6 mm. More or less round in shape; shell hyaline, with surface thrown into ridges forming hexagons.

First Instar: Head width 0.48 to 0.50 mm. Body 5 mm. in length. Body and head yellow.

Second Instar: Head width 0.75 to 0.88 mm. Body 10.0 mm. in length and 1.0 mm. in width. Body and head yellow-green.

Third Instar: Head width 1.1 to 1.2 mm. Body 12 mm. in length and 1.2 mm. in width. Ground colour yellow-green. Middorsal stripe green; subdorsal and subspiracular lines yellow; midventral line pale. Head pale yellow-green with no markings. Abdominal segments clearly segmented by deep constrictions at intersegmental lines.

Fourth Instar: Head width 1.5 to 1.9 mm. Body 13 to 19 mm. in length and 1.6 to 2.0 mm. in width. Body cylindrical, widest at fifth and sixth abdominal segments; abdominal segments somewhat moniliform, the anterior segments being broader posteriorly than anteriorly. Integument smooth. Ground colour green. Middorsal stripe green; subdorsal line greenish yellow; spiracular stripe green; subspiracular line yellow, wrinkled; next line green. Midventral stripe bluish or whitish green. Head (fig. 2a), which may be partially withdrawn beneath prothoracic shield, pea green with no markings; frons concolorous with head; clypeus and labrum translucent light brown; epicranial index 1.1 to 1.7. Distance between ocelli 1 and 2 equal to, or $1\frac{1}{4}$ times, that between ocelli 2 and 3. Prothoracic shield yellow-green anteriorly and pea-green posteriorly. Anal shield green margined with yellow; median seta (α) cephalad of anterior marginal seta (ρ) (fig. 2b). Setigerous tubercles composed of small papillae set directly on the integument. Setae short, dark brown in colour. Spiracles circular, brown with light centres. Thoracic legs green proximally, yellow-green distally. Prolegs green; each ventral one bearing 8 to 18 crochets.

Mouthparts: Mandibles (fig. 1b) light brown with two well defined ridges and the trace of a third; the six or seven teeth truncate. Hypopharynx conical,

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lingua tomentose; remainder of hypopharynx smooth. Spinneret subcylindrical, rounded at top; labial palpi with segments in proportion of 3.8 to 4.0:1:3.3 to 3.5.

Food Plants: Balsam, white spruce, engelmann spruce, tamarack, jack pine, hemlock.

Eufidonia notataria Wlk.

Penultimate Instar: Head width 1.5 to 1.8 mm. Body 11.0 to 14.0 mm. in length and 1.0 to 1.5 mm. in width. Ground colour green. Middorsal line blue-green. Addorsal and subdorsal lines light yellow-green. Spiracular line greenish yellow. Midventral and subventral lines yellow-green. Grey lines often border the three dorsal and two ventral lines. Head light green. Epicranial index 0.83 to 1.0. Distance between ocelli 1 and 2 equal to, or $1\frac{1}{4}$ times, that between ocelli 2 and 3.

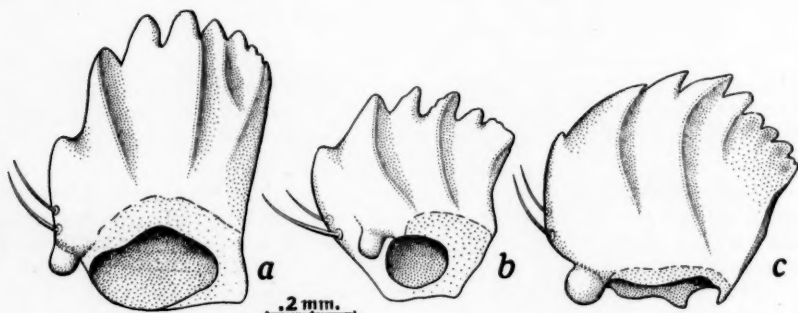


Fig 1. a, Mandible of *Eufidonia notataria*. b, Mandible of *Nyctobia limitaria*. c, Mandible of *Eufidonia discospilata*.

Ultimate Instar: Head width 2.0 to 2.4 mm. Body 15 to 22 mm. in length and 1.5 to 2.5 mm. in width. Body evenly cylindrical, rounding off on last two abdominal segments. Integument rugulose. Ground colour green. Middorsal line green, blue-green or grey-green usually edged with fine grey-green lines. Addorsal line green flanked by grey-green lines. Subdorsal line yellow-green, yellow or ivory-white, and may be flanked laterally by a dark grey or reddish brown line. Spiracular line white edged ventrally with yellow; the yellow portion of this line may be partially or entirely crimson. Midventral light or whitish-green stripe flanked by green lines. Subventral lines whitish-green often with grey borders. Head (fig. 2c) yellow-green or pea-green with small brown or chestnut-coloured spots forming herringbone patterns along the epicranial stem and over the vertices. Frons blue-green or green. Clypeus yellowish-green and labrum brownish-green. Epicranial index 0.80 to 1.11. Distance between ocelli 1 and 2 equal to, or $1\frac{1}{4}$ times, that between ocelli 2 and 3. Prothoracic shield green with yellow suffusions, middorsal and subdorsal lines crossing it. Anal shield green with small brown punctures; rounded at apex; median seta (alpha) caudad of anterior marginal seta (rho) (fig. 2d). Setigerous tubercles small, brown-rimmed papillae set directly on the integument. Setae brown. Spiracles circular, with brown rims and yellowish or light brown centres. Thoracic legs green with reddish or brownish tint distally. Prolegs green; ventral proleg bearing 18 to 26 stout, brown crochets.

Mouthparts: Mandibles (fig. 1a) brown, with three or more ridges and nine teeth. Hypopharynx conical; lingua, gorge and lobes tomentose, with minute spines noticeable in the gorge. Spinneret conical, rounded at tip. La-

bial palpi with the segments in the ratio of 3.0 to 3.7:1:2.3 to 3.0.

Food Plants: Helmlock, balsam, white pine, jack pine, tamarack, white spruce, black spruce.

***Eufidonia discospilata* Wlk.**

Ultimate Instar: Head width 1.9 to 2.1 mm. Body 17 to 24 mm. in length and 1.8 to 2.2 mm. in width. Body widest in the area of the first four abdominal segments anteriorly and posteriorly of which it tapers off gradually. Integument of body rugulose. Ground colour green. Middorsal, addorsal and subdorsal lines light green edged with grey-green. Spiracular line yellow; subspiracular line scarlet. Midventral line wide and white. Between this line and the thin white subventral line is a green area. Intersegmental areas yellowish. Head light green with fine, brown markings arranged in a herringbone pattern along the epicranial suture and over the vertices. Epicranial index 1.1 to 1.3. Distance between ocelli 1 and 2 equal to, or $1\frac{1}{4}$ times, that between ocelli 2 and 3. Prothoracic shield concolorous with dorsum. Anal shield green anteriorly,

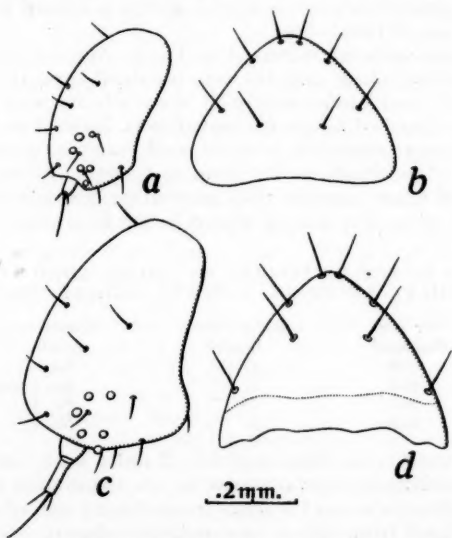


Fig 2. a, Lateral view of head of *Nyctobia limitaria*. b, Dorsal view of anal plate of *Nyctobia limitaria*. c, Lateral view of head of *Eufidonia notataria*. d, Dorsal view of anal plate of *Eufidonia notataria*.

posteriorly yellowish green pitted with small brown punctures; setal positions as in preceding species. Setigerous tubercles composed of small brown-rimmed papillae set directly on the integument. Setae short, brown. Spiracles brown with yellow centres. Thoracic legs green, pale distally. Prolegs green; the ventral proleg bearing 18 to 25 crochets.

Mouthparts: Mandibles (fig. 1c) brown with two prominent ridges and nine or ten teeth. Hypopharynx conical; lingua, gorge and lobes tomentose, with minute spines noticeable in the gorge. Spinneret conical, rounded at tip. Labial palpi with segments in proportion of 4:1:4.

Food Plants: Blueberry, laurel (*Kalmia*) and white birch.

REFERENCES

1. Goodell, L. W., 1882, Can. Ent. 14:198.
2. Packard, A. S. 1890, Fifth Report of the Entomological Commission, p. 782.

THE EFFECT OF SAY STINKBUG FEEDING ON WHEAT*

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Say stinkbug, *Chlorochroa sayi* Stal, is a comparatively new pest of wheat and other seed crops in Western Canada. In the past ten years it frequently has caused severe damage to wheat in many localized areas.

Damage to ripening grain is caused by adult, and occasional nymphal, feeding. The insect pierces the outer glume and kernel with its needle-like mouthparts and withdraws the liquid contents, causing the kernel to shrivel. As a result, both yields and quality of grain are reduced. In very severe infestations all the kernels may be considerably shrivelled and often there is little or no harvestable grain.

The adults and nymphs are usually very abundant in early spring around weeds, particularly Russian thistle, along roadways, ditches, field margins and in abandoned fields. As the grain heads out, the insects migrate to wheat fields to feed. The greatest damage is almost always confined to the field margins nearest the sources of infestation.

In 1941, a severe outbreak occurred at Turin, Alberta, and in the course of investigations, threshed wheat samples were obtained from the infested fields. The commercial grade and bushel-weight of these wheats were determined by the Grain Inspector, Board of Grain Commissioners, located at Lethbridge, Alberta. The percentage-germination tests of each sample were made by the Supervising Analyst, Plant Products Division, at Calgary, Alberta.

The location of wheat samples with percentage damage from *C. sayi* Stal and resultant deterioration of quality is shown in the following table:

LOCATION AND EFFECT OF FEEDING BY *CHLOROCHROA SAYI* STAL
ON WHEAT AT TURIN, ALBERTA, AUGUST, 1941.

Sample Location	Per cent damaged	Weight per bushel	Commercial grade	Per cent germination
East end	66.8	41 lbs.	Feed	59
½ m. west	40.2	57 "	No. 4 Northern	83
1m. "	26.4	59 "	No. 3 "	95
2m. "	14.0	58 "	No. 2 "	97

The samples were taken from a field 2 miles long, running east and west. Stinkbug populations were centered in an abandoned field overgrown with Russian thistle directly across the fence from the east end of the wheat field. The gradation of damage from east to west is clearly shown.

The percentage of damaged kernels was determined by actual count. The above table shows the relationship of damage to grade, bushel-weight and percentage-germination. It is interesting to note that the grade of wheat can be lowered as a result of increased damage without causing marked difference in bushel-weight. This is shown in the last two samples in the table.

Percentage-germination is important, as it is customary for farmers to use their own grain for seed. To be satisfactory for this purpose germination should be at least 90 per cent. The severely damaged sample from the east end of the field, as shown in the above table, indicates that this wheat would be unsatisfactory for seeding. If this were sown as seed, the resultant stand would be greatly reduced.

The feeding of *C. sayi* Stal may cause three types of loss: loss of yield by reducing the weight of grain, loss of grade by lowering quality, and a further loss in yield the next season if the grain of low germination is used for seed.

*Contribution No. 2398, Division of Entomology, Science Service, Department of Agriculture, Ottawa, Canada.

NOTES ON SOME SKIPPERS, WITH NEW RECORDS FOR THE UNITED STATES (Lepidoptera, Hesperiidae)

BY H. A. FREEMAN,
Pharr, Texas*Urbanus doryssus* (Swains.)

A fresh specimen of this species was observed feeding on papaya blossoms, X-28-44, at Pharr, Texas, by the writer. Two ♂♂ were eventually collected near the same spot by the writer, one III-10-45 and the other III-11-45. These two specimens are the first and only ones collected in the United States.

Urbanus auginus auginulus (G. & S.)

On III-10-45, the writer caught a fresh ♀ specimen of this subspecies, minus tails, at Pharr, Texas. The following day a ♂, rather worn but with tails, was taken at the same locality. This establishes another new skipper record for the United States.

Aguna asander (Hew.)

Since recording the capture of a specimen of *asander* (Hew.) by Mrs. E. J. Kelso at Pharr, Texas, * the writer caught a ♂ specimen at the same locality on VIII-22-45. Mrs. Kelso's specimen did not have a date of capture, so the writer thought it wise to publish the date on which he caught his specimen so that other collectors might be able to turn up more specimens at a later date.

Pellicia bromias G. & S.

There are a number of species of the genus *Pellicia* H.-S. recorded from Mexico. However, up to the present time none of these have been recorded from the United States. The writer has two ♂♂ *bromias* G. & S. from Mexico, one caught by himself at Acapulco, Guerrero, VI-15-36, and the other is labelled, "Mexico", Jan., 1940, received from Mr. Don B. Stallings. On IX-23-45, the writer caught a ♀ specimen at Pharr, Texas. This is another new record for the United States.

Carrhenes canescens (Felder)

The writer caught three specimens of this species flying around lemon blossoms in Pharr, Texas, one ♀, 11-16-45; one ♀, 11-17-46; and one ♂, V-5-45. All specimens were fresh, indicating that possibly this species is native to the Pharr vicinity. This is another new skipper record for the United States.

Celaenorrhinus fritzgaertneri (Bailey)

A ♀ specimen of this tropical American species was collected on the campus of the Pharr-San Juan-Alamo High School, just out of Pharr, Texas, on II-20-45, by the writer. This is the first record of this species having been collected in the United States. The writer caught a ♀ of this species at San Luis Potosi, Mexico, VII-2-36, and there is a Mexican specimen in the Stallings and Turner collection; both are lighter in coloration than the Pharr specimen but the general maculation is the same. This is the first record of any member of the genus *Celaenorrhinus* Hbn. having been caught in the United States.

Synapte malitiosa (H.-S.)

Roswell C. Williams and Kenneth J. Hayward point out in their publication† that *Synapte* Mabilie has priority over *Godmania* Skinner and Ramsden by nineteen years; thus the species recorded by the writer ‡ belongs in that genus. Since recording the presence of *malitiosa* (H.-S.) in Texas, the writer has collected a large series of specimens at Pharr during May, July, August, and September, thus establishing the fact that this species is native to Hidalgo County, Texas. One thing of interest showed up in the large series of specimens collected; Texas examples of *malitiosa* are not subject to as much variation in size or coloration as are Mexican specimens.

*Ent. News, 56:102, 1945.

†Hesperiidarum Rei Publicae Aequatoris Catalogus, Tucuman, Argentina, p. 215, 1944.

‡Ent. News, 56:103, 1945.

FURTHER DATA ON THE VALUE OF HAND CONTROL OF THE
TENT CATERPILLAR, *MALACOSOMA AMERICANA* FABR.
(LEPIDOPTERA, LASIOCAMPIDAE) *

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The use of mechanical methods in control of the eastern tent caterpillar was emphasized in an earlier paper (Sweetman, 1940). That report which covered the five-year period 1936-1940 is now brought up through the season of 1945. The site has changed little since 1940 except for the annual increment of plant growth. The wild cherries are more numerous, and the older trees are much taller. The variation in abundance of tents each year follows that of the surrounding area showing that migration into the grounds occurs continually.

During this ten-year period the only method of control has been mechanical; i.e., destruction of the larvae in the tents shortly after hatching. Occasional egg masses, less than five, have been removed. This method has given complete control with a minimum expenditure of time and money.

The results during the last ten years are as follows:

Year	No. of Colonies	Hours of work
1936	no control	16
1937	100-125	
1938	6	
1939	no control	
1940	5	
1941	record lost	—
1942	25	3
1943	6	2
1944	3	2
1945	36	4

Unfortunately the data for 1941 were lost, but it is believed that some colonies were destroyed. A large increase in the number of colonies developed in 1942, but decreased to a low level in 1943. The 1944 record may not be complete as only one search was made in that year, which located three colonies. Perhaps more eggs hatched later in the spring but circumstances prevented further checking. The caterpillars were very numerous about Amherst in 1945, and 36 colonies on the site were destroyed. No colonies were known to have survived and no pupae were observed. March of 1945 was the warmest on record for Amherst, while the temperature was near normal in April. This unusual weather condition stretched the hatching period of the eggs over a longer period than average, which necessitated three searches to eliminate all colonies.

A total of about 2.5 eight-hour days have been expended in locating and destroying the colonies during the 10 years. The nail-claw pole described in the earlier paper was not needed during 1941-1945 as none of the colonies was far from the ground, although some of the cherry and apple trees are over 30 feet tall. A novice, young or old could easily have located and destroyed the colonies. No colonies of the forest tent caterpillars have been observed on the site since 1938.

Conclusion. Destruction of the eastern tent caterpillar just as the colonies are becoming established in the tents can be done efficiently and with a minimum of effort by the method described. Little feeding on the plants has occurred at this early stage of development. These results are in full agreement with and corroborate those reported in 1940. The application of an insecticide before the eggs hatched or on the newly formed tents would have been more costly of

*Contribution from the entomological laboratory of Massachusetts State College, Amherst, Massachusetts.

time and money than the crushing method used. This method with the limitations given in the earlier paper is strongly recommended.

LITERATURE CITED

- Sweetman, Harvey L. 1940. The value of hand control for the tent caterpillars, *Malacosoma americana* Fabr. and *Malacosoma dissiria* Hbn. (Lasiocampidae, Lepidoptera). Can. Ent. 72: 245-50.

FLIGHTS OF *NYMPHALIS CALIFORNICA* BDV. IN BRITISH COLUMBIA AND ALBERTA IN 1945

The spiny caterpillars of this butterfly are known as defoliators of snowbrush, *Ceanothus* spp.; Essig says that during severe outbreaks they feed on other shrubs and on fruit trees and alfalfa. The following records of flights are of particular interest in that no reports of damage by the caterpillars were received during the season of 1945.

On August 25, 1945, the Dominion Forest Insect Laboratory at Vernon received five *Nymphalis californica* (Bdv.) from H. A. de Veber, Superintendent of Waterton Lakes National Park, Alta. He reported: "A large flight (in Waterton Park townsite) occurred August 18 and 19, direction of flight east to west."

Forest Ranger H. J. Coles of Golden, B. C., sent two *californica* on August 27, with the following comment: "There were literally millions of them along the Big Bend Highway last week, between Bush River and Blackwater Lake. I saw them on Friday evening (Aug. 24) as I was coming from Bush River to Golden, but my Patrolman came through the next day and did not notice any to speak of." In a subsequent letter, he stated that the flight appeared to be from northeast to southwest, many of the butterflies being on the ground and few at heights greater than five feet. He also reported seeing another migration, about a week later and a few miles north of the first one; its relation to the first flight is unknown.

The *Kelowna Courier* (Kelowna, B. C. 42 (5):5) for August 23, carried the following item: "Butterfly sensation. Millions of Butterflies Blanket South End on Saturday. —An unusual phenomenon attracted the attention of a large number of residents of the southern section of the city on Saturday (Aug. 18) afternoon. Literally millions of butterflies passed over the area travelling northward.

"All persons who saw the sight agreed that there were many millions of butterflies in the cloud and that they were all black with touches of red. The sight was described by one man as like a plague of locusts seen in the movies depicting disasters in China and Africa.

"They were reported from Strathcona Avenue as far north as the Park. They were seen along the lake front and a couple of blocks from the water.

"One observer stated that they were followed by a large flock of small birds, smaller than sparrows, which, lighting on his lawn, were so thick as to make the lawn invisible."

Upon request, Mrs. J. de Pfyffer of Kelowna submitted three *californica* taken on September 4. She had saved a few from the original migration, but later discarded them; those taken in September appeared to her to be the same.

Hugh B. Leech, Vernon, B. C.

NEW NEARCTIC CRANE-FLIES (TIPULIDAE, DIPTERA): PART XXVI.

BY CHARLES P. ALEXANDER,
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The preceding part under this title was published in 1946 (Can. Ent., 77:186-191). I am here discussing a number of species from the western United States, chiefly from Oregon and California, where they were collected by my friends, Messrs. T. H. G. Aitken, Mont A. Cazier, Kenneth M. Fender and Lawrence W. Saylor, to whom I am greatly indebted for the privilege of retaining the types in my collection. A few additional species were taken by myself in Arizona and Wyoming.

***Lipsothrix fenderi* n. sp.**

Size large (wing, ♂, about 10 mm.); general coloration of thorax whitish; antennae short; central portion of vertex and the basal abdominal tergites weakly infuscated; halteres white; femora white, the tips narrowly blackened; wings uniformly whitish; no macrotrichia in cells of wing; R_2+3+4 in longitudinal alignment with R_2+3 ; cell 1st M_2 large, subequal in length to vein M_4 ; $m-cu$ at or just beyond the fork of M ; male hypopygium with the outer dististyle long and slender, the apical spine unusually elongate.

Male. Length about 8 mm.; wing 10 mm.; antenna about 1.4 mm.

Female. Length about 8 mm.; wing 9 mm.

Rostrum whitish; palpi very pale brown. Antennae short, as shown by the measurements; scape whitish; pedicel very pale brown, flagellum a trifle darker brown; flagellar segments oval to long-oval, with truncated ends; longest verticils exceeding the segments in length; setae sparse and scattered. Head with front, cephalic portion of anterior vertex and the occiput whitish, the remainder of vertex pale grayish brown; anterior vertex broad, exceeding three times the diameter of the scape.

Pronotum whitish. Mesothorax almost uniformly whitened, the praescutal stripes not or scarcely indicated. Halteres relatively elongate, white. Legs with the coxae and trochanters whitened; femora white, the tips narrowly infuscated or blackened; tibiae white, the tips very narrowly infuscated, the bases more or less darkened; tarsi white, the outer segments weakly darkened; claws (♂) with the outermost spine much smaller and weaker than the penultimate one; in ♀ the spines present but weaker. Wings uniformly whitish; veins pale brown, more whitened in the stigmal and prearcular fields. No macrotrichia in cells of wing. Venation: Sc_1 ending just beyond level of $r-m$, Sc_2 close to its tip; R_2+3+4 in longitudinal alignment with R_2+3 , R_4 leaving at a right or strong angle, at its tip deflected strongly caudad, narrowing cell R_4 at the margin; cell 1st M_2 large, subrectangular, nearly equal in length to vein M_4 ; $m-cu$ at or just beyond the fork of M .

Abdominal tergites two to five weakly infuscated, with pale borders, the succeeding segments paler brownish yellow, only the eighth segment pale brown. Male hypopygium with the outer dististyle long and slender, the apex beyond the small ventral spine being unusually elongate; inner dististyle arcuate, narrowed outwardly, without a prominent basal dilation. Interbase strong, the apical spines long and straight.

Habitat. Oregon (Yamhill County).

Holotype. ♂, Peavine Ridge, near McMinnville, Station 3, altitude 605 feet, October 23, 1945 (K. M. Fender). *Allotopotype.* ♀. *Paratopotypes*, several ♂ ♀, September 18 to October 23, 1945 (K. M. Fender).

I take great pleasure in dedicating this very distinct fly to the collector, Mr. Kenneth M. Fender, to whom I am particularly indebted for many Tipulidae from Oregon. The species is entirely distinct from the other described American species. From the others so far discovered in western North America, including *Lipsothrix nigrilinea* (Doane) and *L. shasta* n. sp., it is readily dis-

tinguished by the general pale coloration, short antennae, and lack of macrotrichia in the wing cells. The genus *Lipsothrix* Loew (*Electrolabis* Alexander) is a vastly ancient one, with one species in the Baltic amber (Lower Oligocene) and about a score of recent forms, well distributed throughout the Northern Hemisphere, with one species occurring as far south as Panama.

***Lipsothrix shasta* n. sp.**

General coloration yellow, the mesonotum patterned with dark brown, the dark color not involving the abdominal tergites, as in *nigrilinea*; antennae (δ) moderately long, flagellar segments longer than the verticils; femora yellow, the tips narrowly and abruptly blackened, tibiae yellow, the tips more narrowly infuscated; wings with a yellowish tinge, the prearcular and costal regions more saturated yellow; sparse macrotrichia in outer ends of all cells from R_2 to M_4 , inclusive; R_2+3+4 in virtual longitudinal alignment with R_4 ; inner end of cell R_4 lying more basad than cell 1st M_2 ; abdomen obscure yellow, with a blackened subterminal ring.

Male. Length about 8-10 mm.; wing 9-11 mm.; antenna about 2.5-2.8 mm.

Rostrum light yellow; palpi infuscated. Antennae (δ) moderately elongate, as shown by the measurements, but shorter than in the corresponding sex of *nigrilinea* (antenna, δ , about 4 mm.); scape and pedicel yellow, succeeding flagellar segments weakly bicolored, infuscated on the upper face, yellowed beneath; outer segments uniformly dark brown; flagellar segments subcylindrical, exceeding the longest verticils; besides the latter, the segments provided with a dense erect pubescence. Head above more or less infuscated, pale in front and on the occipital region.

Pronotum dark brown medially, paling to yellow on the sides. Mesonotum extensively infuscated, including a central praescutal stripe, more or less expanded onto the region of the usual lateral stripes; scutal lobes and scutellum even more blackened; mediotergite similarly infuscated; parascutella and pleurotergite pale; humeral region of praescutum extensively pale yellow. Pleura, in cases, uniformly pale yellow; in other specimens, the propleura and extensive areas on the mesopleura pale brown, the latter especially conspicuous on the ventral anepisternum, sternopleurite and pteropleurite. Halteres with stem brownish yellow, knob weakly infuscated. Legs with coxae and trochanters pale yellow, in cases the posterior coxae weakly infuscated; femora yellow, the tips abruptly and conspicuously blackened, the amount subequal on all legs, involving about the distal ninth or tenth; tibiae yellow, the tips more narrowly infuscated; tarsi pale yellow, the terminal segment infuscated; claws conspicuously spined, with two or three subequal major spines, the outermost as large as or larger than the penultimate. Wings with a yellowish tinge, the prearcular field and cells C and Sc even more saturated yellow; veins brown, more yellowed in the saturated fields. Macrotrichia present in outer cells of wing, from R_2 to M_4 , inclusive, but sparser and more restricted to the outer ends of the cells than in *nigrilinea*; stigmal trichia variable, from very sparse or virtually lacking to more abundant. Venation: Sc relatively short, Sc_1 ending just beyond the fork of Rs , Sc_2 near its tip; R_2+3+4 in virtual longitudinal alignment with R_4 ; inner end of cell R_4 lying more basad than cell 1st M_2 ; $m-cu$ some distance beyond the fork of M , varying from about one-fifth to more than one-half its own length.

Abdominal segments obscure yellow, the tergites narrowly more darkened on lateral portions; a subterminal black or brownish black ring, involving much of segments seven to nine, inclusive; remainder of hypopygium obscure yellow. Male hypopygium of the general type of the genus, differing from *nigrilinea* and others merely in details.

Habitat. California (Shasta County).

Holotype. δ , Hatchet Mountain Pass, Burney, altitude 4370 feet, May 30, 1939 (T. H. G. Aitken & Mont A. Cazier). *Paratopotypes.* 2 δ δ .

Lipsothrix shasta is closest to *L. nigrilinea* (Doane), which differs conspicuously in the elongate antennae, different coloration of the legs and abdomen, the more abundant trichia in the outer cells of wing, and in other characters.

Gonomyia (Gonomyia) abyssa n. sp.

Allied to *spinifer*; antennal scape and pedicel darkened; head above uniformly brown; male hypopygium with the apex of lower arm of the inner dististyle a broadly obtuse pale blade, the fasciculate setae subterminal in position; phallosome terminating in a blackened spine; gonapophyses short, nearly equal in size and shape, appearing as nearly straight darkened spines that subtend the aedeagus, both acute at tips.

Male. Length about 3.3 mm.; wing 3.8 mm.

Rostrum and palpi brownish black. Antennae of type black throughout, the scape and pedicel not brightened; in the paratype, presumed to be conspecific, scape and pedicel yellow. Head uniformly brown.

Pronotum and pretergites yellow. Mesonotal praescutum and scutum chiefly grayish brown, the humeral region of the praescutum more yellowed; median region of scutum obscure yellow; scutellum brownish basally, more testaceous yellow at apex; mediotergite yellow, darkened on posterior border. Pleura and pleurotergite yellow, with a narrow but conspicuous brown longitudinal stripe from the cervical region, extending backward across the dorsal pleurites and ventral pleurotergite to the mediotergite, as described. Halteres with stem yellow, knob weakly darkened. Legs with coxae and trochanters yellow; remainder of legs pale brown, the terminal tarsal segments darker. Wings subhyaline, stigma very faintly darker; prearcular and costal regions more whitened; veins pale brown. Venation: Sc short, Sc_1 ending a distance before the origin of R_s about three-fourths the length of the latter, Sc_2 some distance from its tip; cell M_2 open by the atrophy of basal section of M_3 ; $m-cu$ a short distance beyond the fork of M .

Abdominal tergites chiefly brown, the posterior borders and lateral angles yellow; sternites and hypopygium yellow. Male hypopygium with the outer dististyle broad, terminating in a small triangular more sclerotized point; spine of outer margin long and acute. Inner dististyle with the outer arm a narrow pale blade, its apex narrowly obtuse; lower arm much stouter, the apex broadly obtuse; fasciculate setae subterminal in position, the arm only a little longer than the apical lobe of the basistyle. Phallosome with a black apical spine, somewhat as in *spinifer*; gonapophyses short, nearly straight or gently sinuous, subequal in size and shape, both directed caudad; one of the spines is a trifle broader but scarcely longer than the other.

Habitat. Arizona (Coconino County).

Holotype. ♂, Bright Angel Creek, near Phantom Ranch, near bottom of Grand Canyon, altitude 2500 feet, June 14, 1942 (C. P. Alexander). *Paratopotype*, 1 broken specimen, pinned with type.

Allied to *Gonomyia (Gonomyia) spinifer* Alexander, widely distributed in the southwestern United States (Trans-Pecos Texas to southern California), differing especially in slight but important characters in the male hypopygium, particularly the dististyles and phallosome, such as the short subequal gonapophyses.

Gonomyia (Gonomyia) percomplexa n. sp.

Belongs to the *noveboracensis* group; thoracic pleura conspicuously striped longitudinally with silvery white and dark brown; knobs of halteres weakly infuscated; wings with cell M_2 open by the atrophy of basal section of M_3 ; $m-cu$ at fork of M ; male hypopygium with the outer dististyle slender, narrowly darkened at apex and here provided with a small group of eight or nine blackened points; apex of intermediate style dilated, with a single marginal row of about ten long pale setae; phallosome very complex in structure, as in the group, in-

cluding several points and spines on either side, and two pendant plates or blades that are densely fringed with long dark-colored setae.

Male. Length about 5 mm.; wing 5.2 mm.

Rostrum obscure yellow; palpi black. Antennae with basal segments black, flagellum somewhat paler, the segments elongate. Head dark gray, the posterior portions variegated with obscure orange.

Pronotum chiefly very pale yellow. Mesonotal praescutum yellow laterally, with three brown stripes that are more or less confluent in front, the scutal lobes similarly darkened, the surface more or less pollinose to obscure the limits of the areas; median region of scutum and scutellum yellow, the latter brighter; mediotergite brownish gray, the sides obscure yellow. Pleura striped with brown and silvery white, the latter including a broad line from behind the fore coxae to the base of abdomen, more narrowed behind; dorsopleural membrane pale yellow; dorsal brown stripe darker, the ventral one reddish brown, best-developed on the sternopleurite. Halteres with stem yellow, knob weakly darkened. Legs with the coxae and trochanters yellow; femora brown, the bases paler; tibiae and tarsi obscure yellow, the terminal tarsal segments darker. Wings grayish subhyaline, the prearcular and costal cells more yellowed, especially the former; stigma very diffusely and vaguely more darkened; veins brown, yellow in the brightened portions. Venation: Sc_1 ending shortly before the origin of Rs , Sc_2 subequal to Sc_1 ; vein R_3 oblique, about one-third as long as R_4 ; cell M_2 open by the atrophy of the basal section of M_3 ; $m-cu$ at fork of M .

Abdomen dark brown, the incisures narrowly more whitened; hypopygium yellow. Male hypopygium with the outer dististyle slender, at apex narrowly darkened and provided with a small group of eight or nine blackened points; all on the inner face, some stouter than the others; intermediate style much dilated at apex, the outer angle produced into an acute point; apex of style with a single row of about ten long pale setae; inner dististyle expanded on lower margin beyond midlength and here bearing a long stout seta, with three similar powerful setae grouped at apex around a long spine that is about one-half the length of the longest seta. Face of basistyle with a compact group of from 25 to 30 sensory areas bearing long setae. Phallosome large and exceedingly complex in structure, as in the group, including two flattened pendant plates or blades that are densely fringed with long dark-colored setae; central body of phallosome terminating in several points and spines on either side, in addition to flattened pale blades and fimbriations.

Habitat. Oregon (Yamhill County); California (Santa Cruz County).

Holotype. ♂, Peavine Ridge, near McMinnville, Oregon, June 6, 1945 (K. M. Fender). *Paratype.* ♂, Ben Lomond, Santa Cruz County, California, altitude 1500 feet, June 1, 1945 (L. W. Saylor).

The present fly is readily told from the other members of the group by the open cell M_2 and by the details of structure of the male hypopygium. As now known, a very few species constitute the group, including two in Europe (*edwardsi* Lackschewitz and *ithyphallus* Lackschewitz); one in Japan (*horribilis* Alexander); three in western North America additional to the present species (*aciculifera* Alexander, *sevierensis* Alexander, and *tetonensis* n. sp.), and one in eastern North America (*noveboracensis* Alexander), the last being the first described and considered the type of the group.

Gonomyia (Gonomyia) tetonensis n. sp.

Belongs to the *noveboracensis* group; close to *aciculifera* Alexander (Oregon to California) and *sevierensis* Alexander (southern Utah), differing in many details of structure of the male hypopygium.

Basistyle without a group of greatly elongated modified setae on face, as in *sevierensis*, these being restricted from six to seven scattered punctures that bear setae of ordinary size only. Outer dististyle with the apical spatula relatively small. Intermediate style with the apex obliquely truncated, the outer angle un-

darkened and only moderately produced; inner angle a low flange; marginal setae varying from about five to eight. Inner style slender, the tooth on lower margin small and obtuse; apical spine present but small. Phallosome with the terminal spine of the setuliferous arm relatively small and weak, only about half as large as the subapical one; basal spine glabrous, not provided with scabrous points, as in *sevierensis*.

Habitat. Wyoming (Teton County).

Holotype. ♂, Teton National Forest, at Arizona Creek, near Jackson Lake, altitude 6790 feet, July 2, 1941 (C. P. Alexander). *Allotopotype.* ♀, mounted with the type. *Paratopotypes.* Several of both sexes, July 2-8, 1941.

In my detailed report on the Tipuloidea of the Grand Teton National Park (Amer. Midl. Nat., 33:391-439, 1945) this fly had been recorded as being *aciculifera*; in this report a detailed discussion of the type locality is provided (pages 394-395).

Erioptera (Ilisia) unduligera n. sp.

General coloration light gray; antennae black, pedicel enlarged; halteres with knobs infuscated; legs blackened; wings grayish subhyaline, the prearcular field more yellowed; stigmal region vaguely and very diffusely infuscated; vein R_2+3+4 suberect, only about one-half longer than the basal section of R_5 ; cell 1st M_2 closed, m less than one-half as long as basal section of M_3 ; M_3+4 and basal section of M_3 subequal; vein 2nd A rather strongly sinuous; abdomen dark brown, the posterior borders of the segments obscure yellow.

Female. Length about 4.5 mm.; wing 5 mm.

Rostrum and palpi black. Antennae black; pedicel enlarged; flagellar segments subcylindrical. Head above black, paler in front and on orbits.

Pronotum darkened medially, paling to whitish on sides. Mesonotal praescutum and scutum discolored, presumably light gray, patterned with darker; humeral region of praescutum yellow; central area of scutum and outer posterior angles of scutal lobes obscure yellow; postnotum light gray pruinose, the cephalic lateral portions of mediotergite and much of the anapleurotergite yellow. Pleura light gray pruinose, the ventral portion with a grayish yellow longitudinal stripe, this narrowly margined with darker on ventral edge of the more posterior pleurites; dorsopleural region grayish yellow. Halteres with stem yellow, knob infuscated. Legs with the coxae and trochanters obscure yellow; fore coxae darker; remainder of legs blackened, the femoral bases narrowly more brightened. Wings grayish subhyaline, the prearcular field more yellowed; stigmal region vaguely and very diffusely infuscated; veins brown, Sc , R and the prearcular veins more yellowed. Venation: Sc_1 ending nearly opposite R_2 , Sc_2 just beyond one-fourth the length of Rs , the latter long, about equal to vein R_3 ; R_2+3+4 suberect, only about one-half longer than the basal section of R_5 ; cell 1st M_2 closed, small, m less than one-half as long as the basal section of M_3 , M_3+4 and basal section of M_3 subequal; vein 2nd A rather strongly sinuous.

Abdomen dark brown, the posterior borders of the tergites obscure yellow, of the sternites more narrowly and inconspicuously so; subterminal segments obscure brownish yellow; cerci long and slender, gently upcurved.

Habitat. Oregon (Klamath County).

Holotype. ♀, Bly, altitude 4360 feet, June 13, 1945 (K. M. Fender).

Erioptera (Ilisia) unduligera is very different from the other described members of the subgenus in its venation and unpatterned wings. In this latter regard it more nearly resembles *Erioptera (Mesocyphona) melanderiana* Alexander, which differs in the venational details, especially the length and course of vein R_2+3+4 and the shape of cell 1st M_2 , with m and the basal section of vein M_3 subequal. The discovery of the male sex will settle the subgeneric position of this fly.

TYPES OF GENERA AND SUBGENERA OF PIPUNCULIDAE*

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This list of types of genera and subgenera has been compiled to aid workers in the family Pipunculidae. Recently several new genera have been erected in this family and some confusion as to genotypes has arisen.

At present we are in great danger of losing the name Pipunculidae and having to replace it with Dorilaidae. I cannot subscribe to the view that the Meigen name Dorilaidae is correct, because I cannot accept genera without species.

This catalogue has been compiled after a careful study of the works of Aczel, Becker, Collin, Enderlein and Hardy.

ALLOMETHIS Hardy, U. of Kan. Sci. Bul., Vol. 29 (1943), p. 128.

Type: *Allomethis brimleyi* Hardy, Ibid.

Type locality: Raleigh, North Carolina.

ALLONEURA Rondani, Dipt. Ital. Prodr., Vol. 1 (1856), p. 139.

Type: *Alloneura rondanii* Collin, Ent. Mon. Mag., Vol. 81, (1945), p. 3.

Type locality: Europe.

Syn. *Tomosvaryella* Aczel, Zool. Anz. Bd. 125, (1939), pp. 22, 23.

ANACEPHALOPS Aczel, Zool. Anz., Bd. 132 (1940), p. 151.

Type: *Pipunculus amboinalis* Walker, Proc. Linn. Soc., London, Vol. V, p. 150.

Type locality: Amboina.

CHALARUS Walker, Ent. Mag., Vol. 2 (1834), p. 269.

Type: *Cephalops spurius* Fallen, Diptera Sueciae, Vol. I. Syrphici, 16.

Type locality: Europe.

CLARAEOLA Aczel, Zool. Anz., Bd. 132 (1940), p. 151.

Type: *Dorylas adventicius* Kertész, Ann. Mus. Hung., Vol. 10 (1912), p. 285.

Type locality: Formosa.

COLLINIAS Aczel, Zool. Ang., Bd. 132 (1940), p. 151.

Type: *Pipunculus heterostigmus* Perkins, Bul. Exp. Sta. Hawaii, Vol. I, pt. 4, p. 148.

Type locality: Australia.

DORYLOMORPHA Aczel, Zool. Anz., Bd. 125 (1939), p. 22.

Type: *Pipunculus rufipes* Meigen, System Beschreib, Vol. IV (1824), p. 21.

Type locality: Europe.

EUDORYLAS Aczel, Zool. Anz., Bd. 132 (1940), p. 151.

Type: *Cephalops opacus* Fallen, Dipt. Sueciae, Syrphici 15.2 (1816).

Type locality: Central Europe.

NEPHROCERUS Zetterstedt, Insect Lapponica, 1840, p. 578.

Type: *Nephrocerus lapponicus* Zetterstedt, Ibid.

Type locality: Northern Europe.

PIPUNCULUS Latreille, Hist. Nat. Crust. et. Ins., Vol. 3 (1802), p. 463.

Type: *Pipunculus campestris* Latreille.

Type locality: Europe.

PROTHECHUS Rondani Dipt. Ital. Prodr., Vol. I (1856), p. 139.

Type: *Pipunculus auctus* Rondani.

Type locality: Europe.

PROTONEPHROCERUS Collin, Diptera of Patagonia and Southern Chile, pt. 6, fasc. 2 (1931), p. 52.

Type: *P. chiloensis* Collin, Ibid.

Type locality: Chile.

*Contribution No. 249 from the Department of Entomology, University of Illinois, Urbana.

NORTH AMERICAN SPECIES OF THE GENUS *LESTIPHORUS*
(HYMENOPTERA: SPHECIDAE: GORYTINI)

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Over a century ago in his memoir on *Gorytes*, Lepeletier proposed *Lestiphorus* for the reception of Rossi's distinctive European species *Crabro bicinctus*. However, very few subsequent authors have recognized it as a discrete generic entity. It has generally been regarded as merely a species group or occasionally treated as a subgenus of *Gorytes* or some related genus. But *Lestiphorus*, although small, is indubitably entitled to full generic rank.

***Lestiphorus* Lepeletier**

- Lestiphorus* Lepeletier, Ann. Soc. Ent. France, I, pp. 56, 70, (1832).—Dahlbom, Hymen. Europ., I, pp. 156, 480, (1843-5).—Lepeletier, Hist. Nat. Insect., Hymen., III, p. 72, (1845).—Wesmael, Bull. Acad. R. Sci. Belg., XIX, p. 107, (1852).—Pate, Trans. Amer. Ent. Soc., LXII, p. 50, (1936).—Pate, Mem. Amer. Ent. Soc., no. 9, p. 35, (1937).
- Lestiphorus* Agassiz, Nomen. Zool. Ind. Univ., p. 208, (1846); [emend. pro *Lestiphorus* Lepeletier].
- Hypomellinus* Ashmead, Canad. Entom., XXXI, p. 299, (1899).
- Mellinogastra* Ashmead, Canad. Entom., XXXI, p. 300, (1899).—Mickel, Univ. Nebraska Stud., XVII, p. 395, (1918).
- Mellinogastra* (*Mellinogastra*) Rohwer, Proc. U. S. Nat. Mus., LIX, p. 412, (1921).
- Mellinogastra* (*Hypomellinus*) Rohwer, Proc. U. S. Nat. Mus., LIX, p. 412, (1921).
- Gorytes* [in part]: Handlirsch, Sitzber. k. Akad. Wissen. Wien, XCVII, p. 451, (1888); CIV, p. 1026, (1895); [Artgruppe *bicinctus*].—Fox, Proc. Acad. Nat. Sci. Phila., p. 524, (1895).—Kohl, Ann. k. k. Naturhist. Hofmus. Wien, XI, p. 412, (1896).
- Gorytes* (*Lestiphorus*) Berland, Faune de France, X, p. 90, 1925.—Schmiedeknecht, Hymen. N.-u.-Mittel, Europ., Zw. Aufl., p. 684, (1930).—Gussakovskij, Ark. Zool., 24 A, N:o 10, p. 29, (1932).—Maidl & Klima, Hymen. Catal., pt. 8, p. 103, (1939).
- Hoplisus* [*Lestiphorus*?] Richards, Gen. Nam. Brit. Ins., Hymen. Acul., p. 135, (1937).
- GENOTYPE: *Crabro bicinctus* Rossi, 1792 [*Lestiphorus bicinctus* (Rossi)]. Monobasic.

The strongly coarctate first abdominal segment distinguishes *Lestiphorus* from all other genera of Gorytine wasps with the exception of *Psammaletes*. However, the fine, subtile puncturation of the body, the bifid eighth abdominal sternite of the males and the poorly delimited pygidial area of the females will differentiate *Lestiphorus* from that genus. Furthermore, the seventh abdominal of the males of *Psammaletes* is strongly obteched so that only six tergites are evident, whereas the males of *Lestiphorus* have seven tergites clearly visible.

Generic Features. Moderate sized, robust, finely and subtilely punctate forms. Head roundly subquadrate in anterior aspect, transversely oval in dorsal aspect; eyes glabrous, facets uniform in size, reaching to bases of mandibles, inner orbits straight, parallel to slightly convergent above in both sexes; malar space obsolete; ocelli situated in an isosceles triangle; temples narrow; occipital carina almost a complete circle in extent and nearly attaining the hypostomal carinule bordering the shallow subcampanulate oral fossa. Face broad, subquadrate. Antennae situated somewhat above dorsal margin of clypeus toward middle of face; scapes subcylindrical, relatively thick, about one-half the vertical eye length; pedicel short, cylindrical; flagellum filiform, very long and slender, simple in females, in males with eighth and ninth articles excised beneath. Clypeus large, broadly subrectangular to obtapeziform, about three times as wide as long, the apical margin flanged. Maxillary palpi with six, labial palpi with four segments. Mandibles large, heavy, with a large inner preapical tooth.

Thorax robust. Pronotum short, transversely sublinear, rounded and ecarinate above, situated on a level with the simple mesonotum; pronotal tubercles flat. Mesonotal laminae moderate, truncate, with posterior face declivent and concave; sutures between mesonotum and scutellum, and scutellum and postscutellum foveate; scutellum and postscutellum simple. Mesopleura with omauli and sternauli present and distinct, though the latter may be weak or

obsolescent anteriorly; episternal suture with lower ordinate absent, upper ordinate present, vertical and curving backward into the horizontal episternaulus, both of which are obsolescent. Metapleura large, roundly tapering ventrally. Mesosternum rounded, ecarinate anteriorly. Propodeum finely punctate or sculptured; dorsal face with a distinct trigonal enclosure; lateral carinae and stigmal grooves absent.

Legs. simple, slender, elongate. Fore coxae large and prominent, elongate conical. Fore tarsi of females with a distinct pecten of long, slender bristles; terminal segment greatly swollen and furnished with a very large pulvillus. Both sexes with two calcaria on middle tibiae.

Fore wings with marginal cell elongate, lanceolate; three submarginal cells present, the second and third subquadrate; both recurrent veins received well within the second submarginal cell; a fuscous cloud generally evident in marginal and second submarginal cells. Hind wings with cubitus and transverse median veins interstitial.

Abdomen pedunculate, with first segment strongly coarctate. Males with seven tergites clearly visible; without concealed hair brushes along anterior mesal margins of fourth and fifth sternites; eighth sternite bifid. Females with a relatively poorly delimited, flat trigonal pygidial area.

Synonymical Notes. Ashmead, in his classification of the Sphecoidei wasps, proposed the genera *Hypomellinus* and *Mellinogastra* for *Gorytes rufocinctus* Fox and *G. mellinoides* Fox respectively. But the types of these species agree in all essential respects with *Gorytes bicinctus* (Rossi), the genotype of *Lestiphorus*; consequently Ashmead's names must be recorded as synonyms of *Lepeletier's* much earlier genus. In 1921, Rohwer endeavoured to retain *Hypomellinus* as a subgenus of *Mellinogastra*; he based his contention that the two were at least subgenerically distinct upon the fact that in *G. mellinoides* the cubitus of the hind wing arises beyond the transverse median vein, whereas in *G. rufocinctus* these two veins are interstitial. But an examination of the type of *mellinoides* in the United States National Museum reveals that in one hind wing the cubitus arises only slightly beyond the transverse median vein whereas in the other hind wing these veins are almost interstitial.

Maidl and Klima in their recent world catalogue of the Gorytine and Nyssonine wasps* have misinterpreted in characteristic fashion my statement† that the types of *Gorytes rufocinctus* Fox and *G. mellinoides* Fox were congeneric with *Gorytes bicinctus* (Rossi) to mean that these Nearctic species were conspecific with the European one. Accordingly they record *rufocinctus* and *mellinoides* as synonyms of *bicinctus*, although both Nearctic species are quite distinct from the European *bicinctus*. This catalogue abounds in such egregious and inexcusable blunders. Moreover, they have overlooked a number of described species in these groups, and furthermore have made incorrect generic assignments of fully one-half of those species included in their catalogue.

There is no basis, save that of very superficial resemblance, for considering *Hypomellinus* or *Mellinogastra* related to *Mellinus* as Ashmead and various subsequent authors have done. The species associated in the past with these generic names are indubitably Gorytines. But, as I have indicated elsewhere, the species which Mickel in 1916 and 1918 placed in *Hypomellinus* are now referable to *Psammaletes*.

Ethology. There are no definite biological data on the members of this genus. However, like the majority of Gorytines, the species of *Lestiphorus* probably nest in the ground and store their burrows with small Homoptera. Hamm and Richard record with some doubt *Nysson trimaculatus* Rossi as a

*F. Maidl et A. Klima. Hymenopterorum Catalogus Pt. 8, p. 105 (1939).

†Trans. Amer. Ent. Soc., LXII, p. 50, (1936).

parasite of *L. bicinctus*.*

Distribution. The genus *Lestiphorus* is a small group of relatively rare wasps distributed throughout the Holarctic Region. The two South African species (*kraepelini* Brauns and *rufithorax* Brauns) assigned by Maidl and Klima to *Lestiphorus* are referable to other genera. Two species of *Lestiphorus* occur in Europe (*bicinctus* (Rossi) and *bilunulatus* A. Costa); another (*egregius* Handlirsch) is known from the valley of the Araxes in Asia Minor; and recently Gussakovskij has described *pacificus* from the Ussuri region of Siberia. The three North American representatives may be distinguished by means of the following table.

KEY TO NEARCTIC LESTIPHORUS

1. Males 4
Females 2
2. Head and thorax immaculate black; abdomen without yellow maculae or fasciae, but entire second segment and portions of first and third bright ferruginous. Propodeum with trigonal enclosure of dorsal face strongly striate on basal half to three-fourths; the posterior face and posterior portions of lateral faces rugulose. (North Dakota to Washington and British Columbia) *piceus* (Handlirsch)
Head thorax and abdomen with yellow maculation; abdomen not marked with red 3
3. Propodeum with trigonal enclosure of dorsal face striate at extreme base only; the posterior and lateral faces merely finely punctate. First abdominal tergite with only a moderate preapical cincture, the groove of which is not foveolate or punctate. (Texas) *mellinoides* (Fox)
Propodeum with trigonal enclosure of dorsal face striate almost to apex; the posterior and lateral faces finely rugulose and more distinctly punctate. First abdominal segment with a strong preapical cingulation, the furrow of which is punctate to foveolate. (Colorado to Massachusetts) *cockerelli* (Rohwer)
4. Propodeum with trigonal enclosure of dorsal face striate at extreme base only; the posterior and lateral faces merely finely punctate. Head, thorax and abdomen with yellow maculation [supposition] *mellinoides* (Fox)
Propodeum with trigonal enclosure striate almost to apex; posterior and lateral faces rugulose 5
5. Thorax with yellow maculae; first four abdominal segments with yellow fasciae, the second segment black *cockerelli* (Rohwer)
Thorax and abdomen immaculate black; second abdominal segment bright red *piceus* (Handlirsch)

Lestiphorus mellinoides (Fox)

Gorytes mellinoides Fox, Proc. Acad. Nat. Sci. Phila., p. 524, (1895); [♀; Texas].

Mellinogastra mellinoides Ashmead, Canad. Entom., XXXI, p. 300, (1899).

Gorytes (Lestiphorus) bicinctus Maidl & Klima, Hymen. Catal., pt. 8, p. 105, (1939); [in part: *mellinoides* Fox incorrectly reported as a synonym of *bicinctus* Rossi].

Type. ♀; [Bosque County?], Texas. (Belfrage.) [United States National Museum.]

This species has been greatly misunderstood in the past. Most specimens recorded under this name are, I believe, to be accredited to *cockerelli* (Rohwer).

I have seen only the unique female taken by Belfrage, probably in Bosque County, Texas.

Lestiphorus cockerelli (Rohwer)

Gorytes cockerelli Rohwer, Ent. News, XX, p. 371, (1909); [♀; Boulder, Colorado].

Mellinogastra williamsi Mickel, Trans. Amer. Ent. Soc., XLII, p. 402, (1916); [♂; Omaha, Nebraska].—Mickel, Univ. Nebraska Stud., XVII, p. 295, (1918). (New synonymy.)

? *Mellinogastra mellinoides* Mickel, Univ. Nebraska Stud., XVII, p. 395, (1918); [♀; Monroe Canyon, Nebraska].

*Trans. Ent. Soc. London, p. 103, (1930).

? *L[estiphorus] mellinoides* Krombein. Bull. Brooklyn Ent. Soc., XXXIV, p. 143, (1939); [Troy, New York]; (nec Fox, 1895?).

Gorytes (Lestiphorus) williamsi Maidl & Klima, Hymen. Catal. pt. 8, p. 106, (1939).

Gorytes (Gorytes) cockerelli Maidl & Klima, Hymen. Catal., pt. 8, p. 58, 1939; [*Gorytes cockerelli* Rohrer, 1909 (i. e. *Lestiphorus cockerelli*) recorded as a synonym of *Harpactus cockerelli* Ashmead, 1899 (i. e. *Trichogorytes cockerelli*)].

Type. ♂; Campus of the University of Colorado, Boulder, Colorado. July 27, 1908. (T. D. A. Cockerell). [United States National Museum.]

This species has apparently been confused in the past with the Texan *mellinoides*, from which it may be distinguished by the features given in the foregoing key to species.

The present species is a more northern one than *mellinoides*; and ranges from Colorado to Massachusetts. In addition to the type from Boulder, Colorado, I have seen material of *cockerelli* from South Dakota (Belle Fourche), New York (Ithaca), and Massachusetts (Lexington).

Lestiphorus piceus (Handlirsch)

Gorytes piceus Handlirsch, Sitzber. k. Akad. Wissen. Wien, Math.-naturw. Cl., XCVII, p. 456, (1888); [?]; Revelstoke, British Columbia].—Fox, Proc. Acad. Nat. Sci. Phila., p. 524, (1895).

Hypomellinus? piceus Ashmead, Canad. Entom., XXXI, p., 300, (1899).

Gorytes rufocinctus Fox, Canad. Entom., XXIV, p. 153, (1892); [♀; Washington].—Fox, Proc. Acad. Nat. Sci. Phila., p. 524, (1895).—Handlirsch, Sitzber. k. Akad. Wissen. Wien, Math.-naturw. Cl., CIV, pp. 913, 1026, (1895).—Cresson, Mem. Amer. Ent. Soc., no. 5, p. 48, (1928). (New synonymy.)

Hypomellinus rufocinctus Ashmead, Canad. Entom., XXXI, p. 299, 300, (1899).

Lestiphorus rufocinctus Pate. Trans. Amer. Ent. Soc., LXII, p. 50, (1936).

Gorytes (Lestiphorus) bicinctus Maidl & Klima, Hymen. Catal., pt. 8, p. 105, (1939); [in part: *rufocinctus* Fox incorrectly reported as a synonym of *bicinctus* Rossi].

Gorytes (Lestiphorus) piceus Maidl & Klima, Hymen. Catal., pt. 8, p. 106, (1939).

Type. ♂; Revelstoke, British Columbia, Canada. [Natural History Museum, Vienna.]

The immaculate thorax and abdomen, the second segment of which is red, readily distinguishes *piceus* from the two preceding species.

Although I have not seen the type of *piceus* Handlirsch, I am reasonably certain that this British Columbian form is merely the opposite sex of the species which Fox described later from Washington under the name *rufocinctus*. I have seen a male from Washington which agrees very well with Handlirsch's description.

This species ranges from North Dakota to Washington and northward into British Columbia. In addition to the type of *rufocinctus* Fox, I have seen material from North Dakota (Medora) and Washington (Pullman).

THE OCCURRENCE IN NORTH AMERICA OF THE EUROPEAN STAPHYLINID *DELEASTER DICHROUS* GRAV.

Recent tests of the effects of a 5 per cent DDT dust on various household insects in the basement of a cafeteria near Eastview, Ontario, resulted in a high mortality among several species of Coleoptera occurring there. Numerous specimens collected among empty potato sacks were identified by W. J. Brown, of this Division. Among them were three specimens of the European staphylinid, *Deleaster dichrous* Grav. This is believed to be the second record of this species in North America. The first record, made by G. Chagnon, appeared in the Canadian Entomologist, LXVI, 282 (December, 1934). It reported two specimens taken at Longueuil (near Montreal), Que.

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ADDITIONAL NOTES ON COLEOPTERA TAKEN IN
ESSEX COUNTY, ONTARIO*

BY S. D. HICKS,

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The species of Coleoptera listed below have been collected since the publication of a previous list (1944, *Canad. Ent.*, 76:163) of Essex County material.

Mr. W. J. Brown, Division of Entomology, Ottawa, has once more obliged by identifying most of the specimens. Identification of the *Oberea* and *Tetraopes* species was made by Mr. W. S. Fisher of the United States Department of Agriculture, Washington, D. C.

Monophylla terminata Say. Two specimens were taken by sweeping at Roseland and Ojibway.

Acmaeodera pulchella Hbst. Two specimens were taken by sweeping at Roseland.

Anthaxia aeneogaster Lap. One specimen was taken by sweeping at Ojibway.

Colydium lineola Say. Four specimens were taken under bark of *Quercus bicolor* at Ojibway.

Sphindus americanus Lec. Several specimens were taken on and within a black fungus on a stump at Roseland.

Oberea ocellata Hald. One specimen was taken by sweeping at Roseland.

Oberea schaumii Lec. One specimen was taken from *Populus deltoides* at Roseland.

Oberea appalachiana Casey. One specimen was taken by sweeping at Windsor.

Oberea delongi Knull. Males and females were numerous and easily taken from leaves of *Populus deltoides* on June 17 at Roseland.

Oberea canadensis Fisher. Two male specimens were taken on *Salix* sp. at Ojibway and described by Mr. W. S. Fisher as a new species (1945, *Canad. Ent.*, 77:56). This recording is a correction to the notes concerning *Oberea schaumii* in my 1944 list.

Tetraopes quinquemaculatus Hald. One specimen was taken by sweeping at Roseland.

Zeugophora puberula Cr. Several specimens were taken by sweeping at Roseland.

Lema palustris Blatch. Several single and paired adults were taken on the leaves and stems of *Cirsium* sp. at Ojibway.

Calligrapha pruni Brown. Specimens were easily taken on *Prunus americana* at Ojibway, Windsor, and Arner.

Epitrix humeralis Dury. Commonly observed and taken on *Physalis* sp. at Oldcastle.

Epitrix hirtipennis Melsh. Commonly observed and taken on *Physalis* sp. at Oldcastle.

Rhynchites cyanellus Lec. Two specimens were taken by sweeping at Roseland and Ojibway.

Trichobaris trinotata Say. One specimen was taken, others were observed, on *Physalis* sp. at Oldcastle.

Pachyphanes discoideus Lec. Several specimens were taken by sweeping at Roseland and Ojibway.

*Contribution No. 52, Plant Protection Division, Science Service, Department of Agriculture, Ottawa, Canada.

ON SOME CENTIPEDES FROM GEORGIA

BY RALPH V. CHAMBERLIN,

University of Utah, Salt Lake City

In a small collection from Georgia sent me for identification by P. W. Fattig of Emory University are representatives of the chilopods listed below. The types of the two new species described are in the author's collection.

CRYPTOPIDAE

Otocryptops sexspinosus (Say)

One specimen taken at Atlanta, April 6, 1942, and one on Blood Mountain, October 1, 1944.

Theatops posticus (Say)

One specimen taken at Camilla, April 15, 1939.

SCOLOPENDRIDAE

Scolopendra viridis Say

One specimen at Camilla, April 15, 1939; one on Stone Mountain, June 14, 1935, and another at same place July 14, 1937; and one at Boston, April 14, 1939.

ETHIOPOLIDAE

Bothropolys multidentatus (Newport)

One specimen from Atlanta, April 18, 1937, and two from Boston, April 14, 1939.

LITHOBIIDAE

Neolithobius helius Chamberlin

A male and female taken April 15, 1939. This species was described originally from Billy's Island, in the Okefinokee Swamp.

Neolithobius ethopus n. sp.

Dorsum brown to chestnut, the female allotype showing somewhat darker bands over posterior borders of tergites.

Antennae in male holotype composed of 28 (right) to 30 (left) articles, these articles longer than thick.

Eyes with posterior or single ocellus large; the other ocelli in six longitudinal series; e.g., 1+5,6,6,5,4,3.

Prosternal teeth 5+5.

Coxal pores transverse, arranged, in female allotype, as follows: 6,7,7,6, and in male holotype 6,6,6,5.

Ventral spines of first legs 0,0,2,2,1, to 0,0,2,3,2. Ventral spines of penult legs, 0,1,3,3,2; dorsal, 1,0,3,1,1; claw single. Ventral spines of anal legs, 0,1,3,3,2; dorsal, 1,0,3,1,0; claw single. Last three pairs of coxae laterally armed.

Claw of female genital forceps tripartite, with basal spines 2+2.

In the male, the third joint of the anal legs relatively short, strongly expanding distad and dorsally elevated into a conspicuous pilose lobe. The fourth article broadly excavated above, but not furrowed, and with a rounded pilose lobe proximad of the depression or excavation.

Length of male holotype, 19 mm.

Locality: Georgia: Camilla. The male holotype and female allotype taken April 15, 1939.

The new species may be placed with reference to related forms by means of the following key.

KEY TO SPECIES OF NEOLITHOBIUS HAVING BOTH ANAL
AND PENULT LEGS WITH CLAW SINGLE

1. (2) Tibia of all, or nearly all, legs excepting the anal with three ventral spines *N. transmarinus* (L. Koch). 3
2. (1) Tibia of none of the legs with more than two ventral spines 3
3. (6) Dorsal spines of penult legs normally 1,0,3,2,2, or 1,0,2 (2), 2 (3), 1,4. 4
4. (5) Ventral spines of anal legs 0,1,3,3,1, the dorsal normally 1,0,2,1,0; dorsal spines of penult legs 1,0,3,2,3, *N. mordax* (L. Koch). 4
5. (4) Ventral spines of anal legs 0,1,3,3,2; the dorsal normally 1,0,3,1,0; dorsal spines of penult legs 1,0,3,2 (3), 1 *N. helius* Chamberlin. 5
6. (3) Dorsal spines of penult legs normally 1,0,3,1,1, 7
7. (8) Fourth joint of anal legs of male very strongly produced dorsad at distal end *N. xenopus* (Bollman) 8
8. (7) Fourth joint of anal legs not at all but little elevated at distal end 9
9. (10) Third joint of anal legs very strongly elevated above into a conspicuous pilose lobe; fourth joint evenly excavated above, but not furrowed, with a rounded pilose elevation proximal *N. ethopus* n. sp. 10
10. (9) Third joint of anal legs relatively slender, only moderately clavate distad; fourth joint not broadly excavated above, with a distinct but shallow longitudinal furrow; and with no such proximal rounded lobe *N. suprenans* Chamberlin. 11

***Eulithobius fattigi* n. sp.**

Dorsum chestnut. Antennae chestnut, becoming yellow distally. Legs yellowish brown, the posterior pairs more chestnut.

Antennae composed of 37 articles of moderate length.

Eyes narrowly subelliptic, composed of numerous ocelli arranged in about seven longitudinal series; e.g., 1+7,8,8,8,6,5,3.

Prosternal teeth 8+8.

Coxal pores strongly transverse, the surface on which arranged longitudinally depressed or fluted; arrangement in type, 10,10,10,9.

Ventral spines of first legs, 0,0,2,3,2. Ventral spines of penult legs, 20,1,3,3,2; dorsal, 1,0,3,1,1.; claw single. Ventral spines of anal legs, 0,1,3,3,2; dorsal 1,0,3,1,0; claw single. Last three pairs of coxae laterally armed.

Anal and penult legs in the female long and slender.

Claw of female genital forceps long, distally narrowed; tripartite, the lateral teeth small. Basal spines 2-2 cylindrical to the short acute apical section.

Length, about 23 mm.

Locality: Georgia: Boston. One female taken April 14, 1939.

Readily distinguishable from *E. hypogeus* Chamberlin, known as occurring in the burrows of the pocket gopher at various localities in Florida, in having the ventral spines of the anal legs 0,1,3,3,2, instead of 0,1,3,2,1, with the dorsal spines 1,0,3,1,0, as against 1,0,2,1,0, as well as in the ventral spining of the penult legs. Also, the basal spines of the female genital forceps are 2+2 instead of 3+3.

GEOPHILIDAE

Geophilus mordax (Meinert)

One specimen from Rockmart, taken April 30, 1939.

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